Saskatchewan Ministry of Agriculture

CROP PRODUCTION NEWS

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CROP PRODUCTION

PRODUCTION

Editor's Comments

By Faye Dokken-Bouchard, PAg, Crops Branch

Saturated soil, cool conditions, lack of sunshine and soil-borne pathogens all have something in common – they can cause crop yellowing. Given the conditions we have experienced so far this year, crop yellowing during early growth stages can be expected due to a combination of these and other factors.

1) Roots need oxygen. When soil is saturated, air pores in the soil fill with water causing roots to function poorly or not at all, which results in yellow top growth.
2) Cool growing conditions result in seedlings with a slowed rate of metabolism. Slow root growth can cause plants to turn pale green, while near-freezing temperatures can cause yellowing.
3) Lack of sunshine causes plants to turn pale green and yellow due to a reduction in the process of photosynthesis.
4) When plants are stressed under adverse conditions, they are more susceptible to seedling diseases such as damping-off, root rot and seedling blight. Symptoms often involve yellowing, wilting, stunting or death. Causal pathogens are often fungi that prefer warm, moist conditions.

The solution to crops yellowed by this spring's saturated soil is patience. A few days of warm, dry weather and sunshine will allow the crop to recover. However, while some plants may grow out of their seedling disease issues, others may die or do poorly. These will likely be confined to patches within the field where the soil stays saturated for prolonged periods. Crop scouting will be critical for proper nutrient management as well as weed and pest control, particularly in fields that have been stressed by poor conditions.

NOTE: Throughout this document, you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this on your computer screen, click your cursor on the link to take you directly to the website. ☼

Crop Production News is a biweekly publication prepared primarily by provincial specialists with the Crops Branch and Regional Services Branch of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

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Crop Protection Laboratory Update

By Philip Northover, AAg, Supervisor, Crop Protection Laboratory

Since the beginning of April, more samples have been submitted for testing to the Crop Protection Laboratory than had been submitted at this time last year.

Samples for testing herbicide resistance in wild oats from 2009 continued to arrive through much of May. Testing from the 2009 season is now virtually complete.

Figure 1: *Corydalis aurea*
Source: Saskatchewan Agriculture.

Since the last report, the lab has identified downy brome (*Bromus tectorum*), awned wheat grass (*Agropyron subsecundum*), golden corydalis (*Corydalis aure*a, Figure 1), golden rod (*Solidago* spp.) and wild radish (*Raphanus raphanistrum*), among others.

The lab has also identified a number of diseases, including wheat streak mosaic (three samples), *Stigmina* or *Rhizospheara* needlecast of spruce, brown root rot of alfalfa (Figure 2), *Fusarium* root rot of winter wheat, pink and speckled snow mould on winter wheat.

An unidentified virus on chokecherry has also been observed.

Insects identified include a seed bug, wireworm, a plutellid (diamond back moths are an example), maple bladder gall mite and a strawberry root weevil.

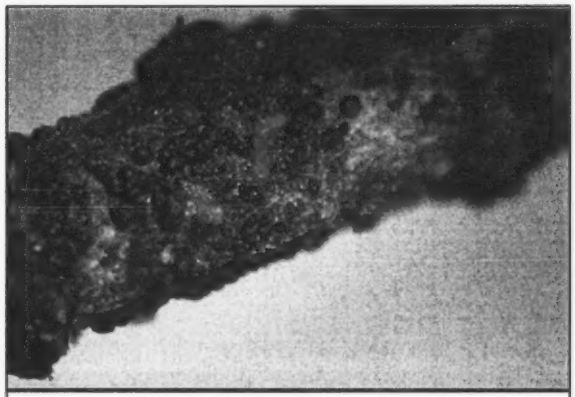

Figure 2: Brown root rot of alfalfa
Source: Saskatchewan Agriculture.

Sample submissions have increased in the last week; perhaps an indication summer is beginning. ☼

Agriculture Knowledge Centre Update

By Brent Flaten, PAg, Integrated Pest Management Specialist

Most of the calls to the Agriculture Knowledge Centre during the past week have been regarding seeding considerations given the wet weather. This includes whether to switch to shorter-season varieties and crops, or leave land unseeded. There have also been questions about leaving volunteer crops to mature for harvest.

Other topics included cropping options considering re-cropping restrictions of herbicides used last year, herbicide choices in-crop, forage termination and weed identification. We expect there may be in-crop herbicide application challenges, especially with herbicide application timing on pulses due to the rain and wet fields. There are also some hot spots for cutworms where producers are applying insecticides.

On the soils side, topics included recommending general fertilizer rates, safe seed row fertilizer application rates and potential fertilizer losses in saturated soil conditions including if land is not seeded.

Forage topics included seeding recommendations and discussions about when, where and how severe alfalfa weevil will be this year. Regional forage specialists will be doing an insect survey in alfalfa fields this year to get a better handle on alfalfa weevil and other insects that are pests in alfalfa.

To contact the Agriculture Knowledge Centre, call toll-free 1-866-457-2377 or email aginfo@gov.sk.ca.

For information about submitting samples to Saskatchewan Agriculture's Crop Protection Lab, go to www.agriculture.gov.sk.ca (Programs & Services > Crop Protection Lab Services); or www.agriculture.gov.sk.ca/web_videos Or phone (306) 787-8130.

Considerations When Seeding in June: Phosphate and Seeding Tips

By Ken Panchuk, PAg, Provincial Specialist, Soils

Selecting an earlier maturing crop/variety, increasing the seeding rate, seeding shallow and adding starter phosphate fertilizer form an agronomic package that will give producers the best chance of hastening maturity.

Phosphate is needed for early, healthy root development and late seeding is no different. Part of the strategy for hastening maturity is establishing the plant sooner. In June, with good to excellent soil moisture and long day length and heat, plants will be growing very rapidly and needing slightly more phosphate. Phosphorus, which is essential for cell division and energy transfer within plant tissue, becomes very important during rapid growth. Producers cannot afford to have sluggish seedling growth in June, limited by low phosphorus availability in the first weeks of plant growth when plant root systems are small.

Similarly, a deficiency of sulphur for canola and mustard can delay maturity because sulphur is not translocated within canola and mustard plants. However, if plant-available sulphate-sulphur was not applied at seeding, ammonium sulphate can be broadcast anytime after seeding up to the flowering stage of canola. The earlier growth stage the sulphate-sulphur is applied, the better the chance of optimizing yield and minimizing delayed maturity.

Shallow seeding is sufficient when there is good to excellent seedbed moisture. About a half-inch is deep enough for canola and about an inch deep for cereals. On-row packing will ensure good seed-to-soil contact given the present soil moisture conditions.

Seeding rates can be increased to the high end of the optimum range of emerged plants per square foot to assist in hastening crop maturity. Because more crop plants are competing for a fixed amount of resources, they will mature faster. For example, a recent study with AC Metcalfe and CDC Copeland malt barley showed that seeding rates resulting in plant populations of 28 plants per square foot (300 plants per square metre) had a reduction in days to maturity, more uniform kernel size, lower barley and malt protein and lower beta-glucan. These are all desirable characteristics for malt barley. Similarly, with canola the optimum plant population ranges from seven to 14 plants per square foot (70 to 150 plants per square metre). When the plant population is at the high end of the range, there are more plants resulting in less branching, thus hastening the maturity of the crop. Figures 3 and 4 show that canola yield comes mostly from main and primary branching at the higher end of the optimum plant population.

To find seed of earlier maturing crops and varieties, review a copy of the *Varieties of Grain Crops 2010* or a copy of *2010 SaskSeed Guide*.

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Considerations when seeding in June, phosphate and seeding tips
(Continued from page 4)

Follow guidelines for safe rates of phosphate when applying in the seed row to minimize risk of seedling damage. Other macronutrients also need to be added in the correct amounts to create a balance of nutrients for optimum crop health and productivity.

For more information go to:
www.agriculture.gov.sk.ca/Production. Follow the link to Crops – Fertilizer/Nutrients, then *Phosphorous Fertilization in Crop Production* and/or *Guidelines for safe rates of fertilizer applied with the seed.* ☼

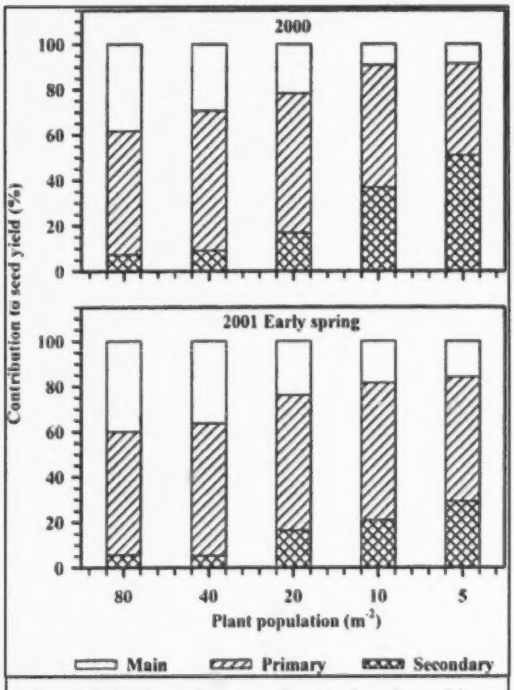

Figure 3: Main, primary and secondary branching contribution to yield of canola by plant population.

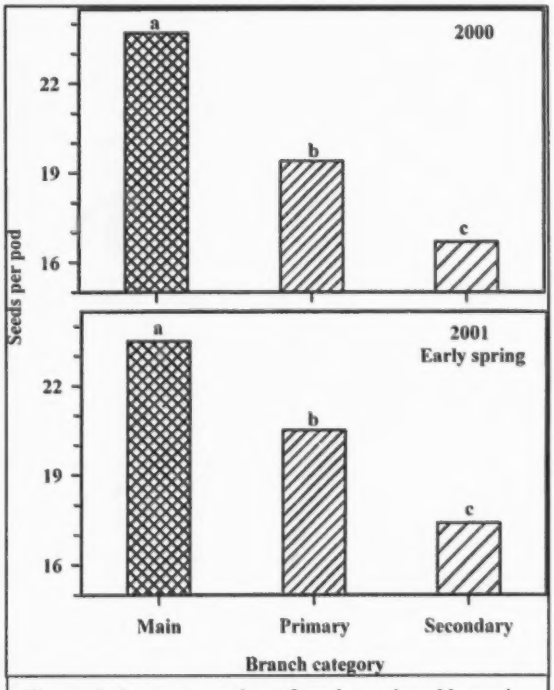

Figure 4: Average number of seeds produced by main, primary and secondary branch pods of canola for the study in Figure 3.

More Tips for Seeding in June

By Colleen Redlick, Crops Intern, North Battleford

With yet more rain falling across the province, seeding progress has been delayed compared to past years. While nothing can be done about the weather, there are some specific agronomic practices farmers can use to help mitigate risks when seeding late.

Seeding rate is one important factor in optimizing yield potential. Increasing seeding rates to target the high end of recommended plant populations should be considered. Increasing plant populations reduces days to maturity and may help late-seeded crops escape fall frosts. Higher seeding rates will also provide better crop competition against weeds, improving weed control.

Crop and variety selection also become increasingly important when seeding is delayed. Planting certified seed, with a shorter maturity length and a better disease resistance package can help maximize yield potential and crop quality. The Canola Council of Canada suggests that the expected length of time maturity is delayed will typically be about half the length of time seeding was delayed. Therefore if you seed two weeks late, the delay in maturity will be about one week.

If maturity is of concern one can start by looking up a variety's days to maturity in the 2010 *Varieties of Grain Crops*. Table 1 shows relative maturity ranges for spring crops grown in Saskatchewan. If your chosen variety does not meet the required maturity time, an earlier variety or crop may need to be selected.

Seeding depth should also be closely monitored. There is no longer any need to be chasing moisture and seeding deep. A good strategy is to seed shallower for quick emergence and take advantage of all the remaining growing season. Table 2 shows that shallow seeding results in rapid emergence.

Fertilizer may also need to be adjusted when putting the crop in late. As the days available for crop development are decreased, so is the yield potential. Therefore, fertility should be adjusted to reflect this. Nitrogen in excess of the optimum yield for the growing conditions may result in delayed maturity. Phosphorus applications should be maintained or increased slightly as phosphorus is essential for rapid seedling growth and can result in earlier and more uniform maturity. Having adequate sulphur for canola is also critical because a shortage of sulphur during flowering and seed filling can delay maturity. Sulphur is not translocated within the canola plant, so a supply of plant-available sulphur is needed from emergence to the end of seed filling.

Insect damage and disease pressure also increase in importance when seeding is delayed. Late-planted wheat fields, for example, may be at higher risk to fusarium head blight and rusts.

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More Tips for Seeding in June

(Continued from page 6)

Therefore in addition to planting resistant varieties, regular monitoring of fields to determine whether fungicide or insecticide applications are necessary becomes even more important than in other years. Addressing these problems quickly will help ensure that further delays in crop development are avoided.

Good agronomic practices are always valuable in helping ensure a successful crop is produced. However, when additional factors such as delayed seeding come into play these practices become even more critical. ✿

Table 1. Relative maturity ranges for spring crop grown in Saskatchewan.

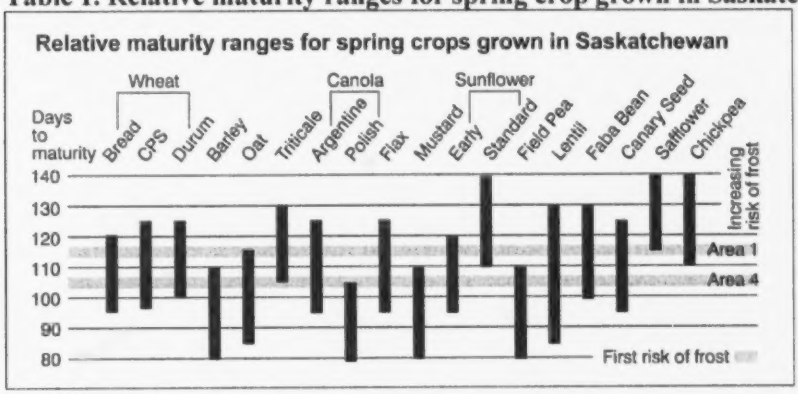

Table 2. Effect of soil temperature and seeding depth on time to emergence of winter wheat (From: De Jong and Best, 1979)

Soil Temperature °C	Time to Emergence (days) Seeding Depth (inches)				
	1/2	1	2	3	4
5.0	17.0	21.0	23.0	29.0	37.0
12.5	6.8	7.0	8.8	11.0	11.5
19.4	3.8	4.0	6.0	6.5	7.0
26.7	3.2	3.8	4.5	5.0	5.5

Plant Growth Stages

By Sherrilyn Phelps, PAg, Regional Crops Specialist, North Battleford

Cereals

Counting leaves is tough with cereals, but if you follow these basic steps it may be easier. For this time of year we will focus on the vegetative and early reproductive phases for the crop.

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Plant Growth Stages
(Continued from page 7)

Tips for Staging Cereals:

1. Choose 10-15 plants at random from the field. Some people throw a hat into a field to select plants; others use the location at the toe of their boot.
2. Gently pull out the plant you have chosen so that the crown area is in good shape.
3. Locate the first leaf:
    - Lowest leaf with a blunt tip.
    - First leaf sheath encloses all later leaves.
    - First leaf will be on the opposite side of the plant as the coleoptile and the coteoptilar tiller.
4. Position plant so the first leaf points to your left; fan out the leaves and tillers and locate the main shoot or stem, which has the tallest and most leaves.
5. Count the leaves on the main shoot or stem (leaves arise on opposite sides of shoot). A leaf is counted only if it is over one-half the length of the leaf below it.
6. To count tillers:
    - Locate the prophyll (sheath) enclosing the base of the tiller (Figure 5).
    - Primary tillers arise from each leaf of the main stem (Figure 6).
    - Coleoptilar tillers arise from the colopetilar node at the base of the plant. They appear separate from other tillers and are not counted for staging.
7. To check for jointing and stem elongation, remove the roots and tillers.
    - Split the remaining stem in half and locate the position of the growing point or grain head.
    - If three to four nodes are visible, check to see if the last leaf is the flag. Cut the stem below the highest node, unwrap the stem/leaves to expose the developing head. If there are no leaves enclosing the head then the last leaf is the flag leaf. The flag leaf emerges last before the head emerges and is the major contributor to grain yield. Emergence of the flag leaf is important for timing the application of plant growth regulators and fungicides.
    - The leaf prior to the flag leaf is called the penultimate leaf (second last).
8. Boot stage
    - The head within the flag leaf sheath is known as the boot. Note the swelling of the boot as the flag leaf sheath extends and the developing head moves upward through the stem.
    - The boot stage ends when the awns are visible.
    - This is the stage when susceptibility to wheat midge starts. As soon a boot splits, the crop is susceptible.
9. Head emergence starts when the first spikelet is visible above the flag leaf, and ends when the head is fully emerged. Flowering may occur even before the head has completely emerged.

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Plant Growth Stages
(Continued from page 8)

- Closed-flowering cereals (most barley varieties) – flowering occurs prior to head emergence.
- Open-flowering cereals (most wheat varieties) – flowering and pollination occur one to seven days after heading.
- Visible yellow anthers mark the end of flowering, and the number of kernels is determined at this time.
- Grain development begins within hours of fertilization.

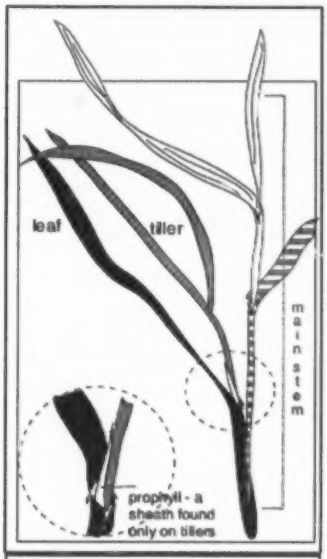

Figure 5: Prophyll.
Source: Saskatchewan Agriculture.

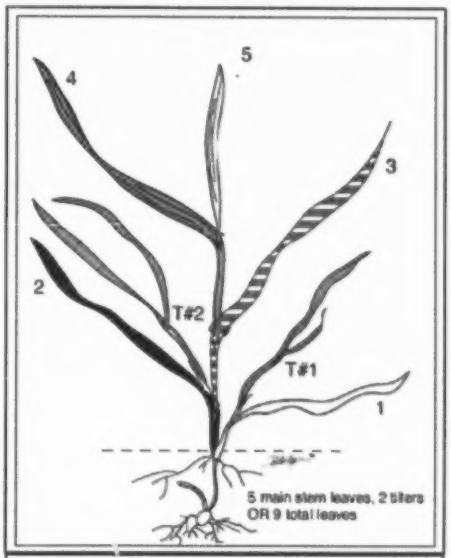

Figure 6: Staging a cereal plant.
Source: Saskatchewan Agriculture.

Broadleaf Crops

Broadleaf crops are more straightforward than the cereal grains. The first 'leaves' that appear on most broadleaf crops are called the cotyledons and these are not true leaves and are often shaped differently than true leaves. The first true leaves appear from the growing point between the cotyledons. Therefore, in most cases the growing point is above ground and is very susceptible to frost or other injury.

Tips for Staging Broadleaf Crops:

1. Gently pull out the plant to expose the whole plant including the underground portion. Be careful not to damage the cotyledons (if present).
2. Leaf development: Do not count cotyledons as a leaf. Locate the leaves and determine whether the crop/weed has opposite, alternate or whorled leaves. (Figure 7)

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Plant Growth Stages

(Continued from page 9)

- Count leaves when visibly separated from terminal bud.
- Opposite leaves – count in pairs. Leaf stage should always be an even number.
- Alternate leaves – count individually.
- Whorled leaves – count each whorl as a leaf.

3. Rosette stage occurs especially with *Brassica* species and involves compact rosette of leaves prior to stem elongation. Branching or tillering can occur in broadleaf plants such as flax.
4. Stem elongation overlaps leaf development. At or just prior to stem elongation, flower and branch initiation begins.
5. Flower development growth stages overlap stem development. Flower buds remain closed during early stem elongation and can be seen by peeling back young leaves. Green bud stage occurs when the flower buds can be seen from above but are still not free of the leaves.
6. Maximum leaf area is usually reached near the beginning of flowering. The upper leaves at this stage are the major source of food for the growth of stems and buds and need to be protected from pest pressure.
7. Flowering stages are represented by the percentage of flowers on the main raceme. Full flowering occurs when 50 per cent of flowers on main raceme are open and older petals are starting to fall.

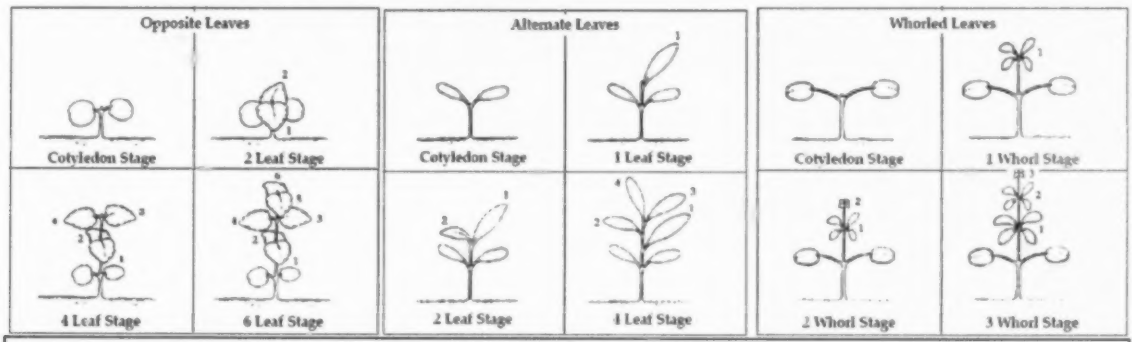

Figure 7: Counting leaf stage based on leaf arrangement.
Source: Saskatchewan Agriculture.

Pulse/Legume Plants

Pulse crops or legumes are the exception as they do not have cotyledons above ground and are staged by the number of nodes or number of leaves (Figures 8 and 9). The first node is often below ground, allowing the seedling to re-grow if the above-ground portion is damaged. The first and second nodes have reduced leaves called scale leaves. Under favourable growing conditions, basal branches will develop from one or both of these nodes by the six-leaf stage. Scale leaves are not considered true leaves. The first true leaf is located at the third node position. Therefore, node and leaf stages always differ by two. Make sure you know on what staging pesticide recommendations are based. ✿

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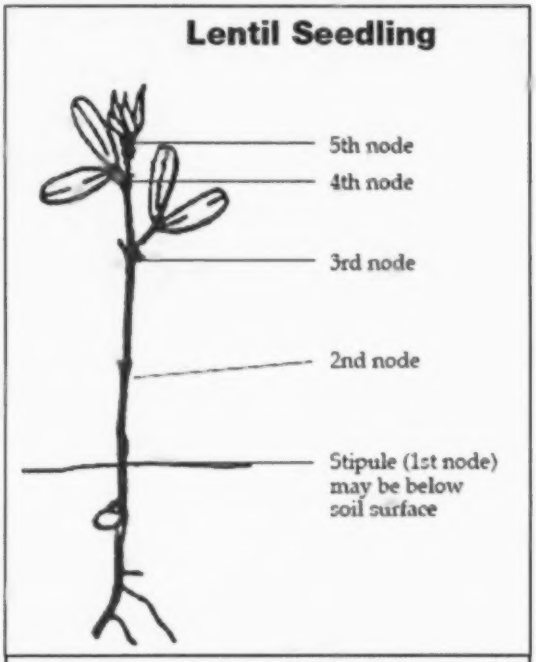

Figure 8: Lentil Seedling.
Source: Saskatchewan Agriculture.

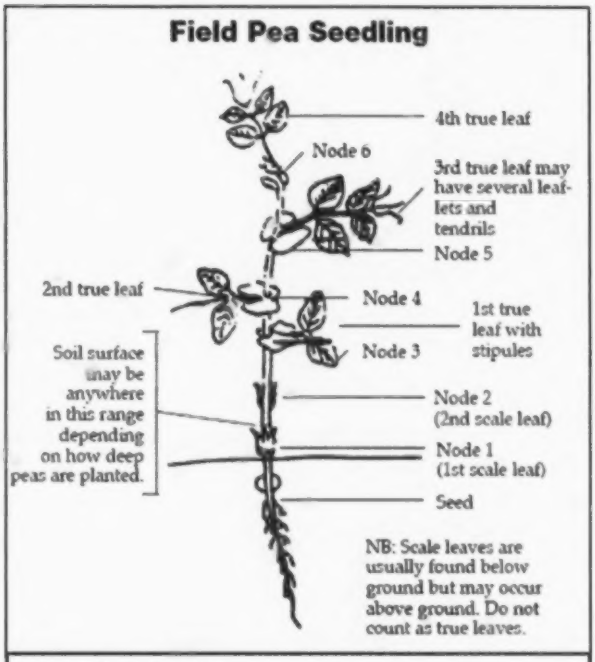
Field Pea Seedling
4th true leaf
Node 6
3rd true leaf may have several leaflets and tendrils
Node 5
2nd true leaf
Node 4
1st true leaf with stipules
Node 3
Soil surface may be anywhere in this range depending on how deep peas are planted.
Node 2 (2nd scale leaf)
Node 1 (1st scale leaf)
Seed
NB: Scale leaves are usually found below ground but may occur above ground. Do not count as true leaves.

Figure 9: Pea Seedling.
Source: Saskatchewan Agriculture.

Using Growing Degree Days to Estimate Maturity

By Tom Boyle, PAg, Regional Crop Specialist, Prince Albert and John Ippolito, PAg, Regional Crop Specialist, Kindersley

When seeding in June, a summer featuring sunny days with high temperatures is on the wish list.

Producers are familiar with the days-to-maturity concept that is commonly used to compare varieties and crop types. The relative maturity ratings are the number of days required from seeding to swathing readiness. Days to maturity become a greater concern when seeding is delayed. This number is not to be considered to be an absolute number as local climatic conditions can cause variation in the actual number of days required.

It has become common to refer to Growing Degree Days (GDD) as a measurement tool for crop development.

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Using Growing Degree Days to Estimate Maturity
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GDD is a combination of time and temperature and is a more accurate predictor of maturity than calendar days because it accounts for variations in climatic conditions. This system is very useful because plant development and physiology are based on heat accumulation.

Growing degree days are calculated as the average daily temperature minus five to arrive at the daily GDD.

As an example, a day with a maximum temperature of 20C and minimum temperature of 10C would have a GDD accumulation of (20 + 10)/2 – 5 = 10 GDD.
Five degrees is subtracted as it is considered to be the minimum temperature for plant growth.

Research has shown that each crop has its own requirements for heat accumulation or GDD to reach maturity. Table 3, from work done by Brian Fowler and Brian Duggan at the University of Saskatchewan, shows the average GDD requirements for crop varieties commonly grown in Saskatchewan.

Table 3: Different crops GDD requirements.

Crop	GDD requirement
Flax	1,200
HRS wheat	1,175
Argentine canola	1,040
Oats	961
Barley	850
Polish canola	850

Using Prince Albert for example, the average GDD from June 1 through to August 31 is about 1040. This number gives us a benchmark to assist in cropping decisions. Using this information, you may also be able to get a better picture of when to expect crop maturity based on time of seeding and GDD accumulation. For example, in an average year, canola seeded at Kindersley on May 1 and requiring 1,040 GDD, the expected maturity date based on GDD would be approximately August 25. If this same crop was to be seeded on May 25, the expected maturity date would be September 19. The time to maturity is shortened by roughly seven days because of higher temperatures in mid-to-late-August compared to early May.

Stu Brandt's studies at the Agriculture and Agri-Food Canada Scott Research Station show that canola crops require the most GDD during seed fill while cereal crops have their major requirement during vegetative growth (Table 4). Hot weather in early summer would be of most benefit to the cereals, and warm August days would help canola more.

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Using Growing Degree Days to Estimate Maturity
(Continued from page 12)

Table 4. Summary of crop thermal requirement (GDD 5C base). Stu Brandt, AAFC Scott, 1993-1997, unpublished.

Crop	emergence to flowering	start to end of flowering	end of flowering to mature	Total GDD
B. napus	375	222	413	1,010 – 1,063
B. rapa	284	241	366	891 – 938
B. juncea	294	241	425	960 – 1,006
S. alba	280	254	438	972 – 1,011
Flax	429	165	410	1,004 – 1,050
Pea	545	165	292	911 – 960
Lentils	507	198	338	1,043 – 1,088
Wheat	525	135	346	1,006 – 1,046

This model can be used to estimate maturity times, but will not account for other climatic impacts such as temperatures at flowering and day length that may have impacts on flowering and yield.

There are couple of very useful tools for using this concept. Various weather websites provide a lot of historical information and allow you to easily look at detailed weather data that, with a few keystrokes, you can tailor to fit your needs. The Winter Cereals Weathermanager site (www.wintercereals.ca/weathermanager) can be used to estimate probability of maturity by a specific date for a number of crops and locations based on growing degree days and seeding dates. Farmzone (www.farmzone.com) provides you with the option of looking at growing degree days on a daily basis or an accumulation for a specified time period. The websites www.weatheroffice.gc.ca and http://weatherfarm.weatherbug.com also are good spots to look at if you require weather data to help do some planning.

For more information on using these tools contact your nearest Regional Office. ✿

Controlling Weeds in Flooded Fields

By Clark Brenzil, PAg, Provincial Specialist, Weed Control

Many fields in Saskatchewan are still saturated after a couple of weeks of what seems like non-stop rain. With the sun emerging and soil temperatures rising, crops will begin to emerge. Meanwhile, weed growth will resume in fields that were planted and those yet to be planted.

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Controlling Weeds in Flooded Fields

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Producers may wish to control weeds before planting, or catch seeded crops prior to emergence or in the early growth stages in order to maximize yield benefits of early weed control. However, not everyone will be able to get into fields yet. Aerial application of herbicides may be an option to address the problem of wet fields.

With respect to pre-seed burnoff or in-crop applications for glyphosate-tolerant canola or summer fallow, *Roundup WeatherMax* is the only glyphosate brand that carries a registration for these uses. Aerial application of *Roundup WeatherMax* for pre-seed burn-off, summerfallow or in-crop in glyphosate tolerant canola is a 'Restricted Use' and there are significant limitations placed on its application by air:

- Applicators must have successfully completed a *Roundup* herbicide aerial application training course provided by Monsanto Canada (See Table 5 below).
- Aircraft to be used must have been configured and calibrated to acceptable standards at a recognized calibration (pattern assessment) clinic within 20 months of the date of application.
- *Roundup WeatherMax* may be applied with aerial equipment only if ground equipment cannot be used due to flooded field conditions. The applicator and the producer will determine if the field is too wet to spray by ground.
- Aircraft used in the application must carry a minimum of $25,000 drift insurance.
- The pilot making the application will have at least 250 hours of actual aerial application time and a minimum of 100 hours within the last 24 month period or be supervised by another pilot/applicator that does.
- Use a minimum spray volume of 30-100 litres per hectare (2.7 to 8.9 imperial gallons per acre).
- The following buffer zones will be observed from the downwind edge of the boom:
    - Pre-seed or fallow – 30 metres to aquatic habitat and 70 meters from other non-target areas;
    - Post emergent to glyphosate tolerant canola – five metres to aquatic habitats and 40 metres to other non-target areas;
    - Other restrictions as indicated on the label.

For in-crop applications by air in other crops, several other herbicides are registered for aerial application (see Table 6). Follow restrictions as indicated by the labels. Do not apply herbicides by aircraft that are not registered for this use. Not all tank mixes with the products below are registered for application by air.

Producers should note that while aerial application does provide an opportunity to have herbicides applied under conditions that ground-based sprayers may not be able to treat the whole field, there are some down-sides to aerial application. Most aerial applications use low water volumes. This may mean that performance of contact herbicides will not be as good in some cases. In addition, set-back buffers from aquatic areas and sensitive non-target upland plants are often much greater than with ground-based application, leaving field edges untreated in some cases. The application window is often smaller with aerial application because lower upper limits on wind speed at the time of application are often imposed.

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Controlling Weeds in Flooded Fields
(Continued from page 14)

Table 5: Post-emergent Herbicides Registered for Application by Aircraft

Crop Type (check products for specific crop)	**Herbicides with Aerial Application Registration** (* see the 2010 Guide to Crop Protection for more details – use labels for specific application requirements)
Cereals	2,4-D (not all products), Avenge, bromoxynil products, bromoxynil/2,4-D products, bromoxynil/MCPA products, clodinafop (select products only*), dicamba products, dicamba/mecoprop/MCPA products, dichlorprop/2,4-D products, DyVel, fenoxaprop products, Harmony SG, Infinity, MCPA (not all products), Clovitox only (MCPB/MCPA), Simplicity, Refine SG only (thifensulfuron/tribenuron), Thumper Total, Titanium, tralkoxydim (cereals only except perennial cereal rye), Tundra, Velocity M3
Pulse Crops	Basagran (dry beans or soybeans only), Poast Ultra, quizalofop
Oilseeds	Roundup WeatherMax (glyphosate tolerant canola only - see article for details), Liberty (Liberty Link canola only), Poast Ultra, quizalofop

Table 6: Saskatchewan Aerial Applicators with Monsanto Training for Pre-seed, Fallow and Post Emergence in Glyphosate Tolerant Canola (flooded fields only)*

Business*	**Nearest town**	**Telephone**
Battlefords Airspray	North Battleford	306-445-3099
Bouchard Bug Busters	Fertile	306-452-6133
Brennan Jardine Aerial Spraying Ltd.	Nipawin	306-862-6701
	Saskatoon	306-290-4469
Davidson Aero-Spray Ltd.	Davidson	306-567-4200
Dentelle Aviation	Eston	306-962-4334
Farr Air Inc.	Weyburn	306-536-0891
Fly on Ag Service	Lake Lenore	306-598-2033
Flying Acres Air Service Ltd.	Hazenmore	306-264-3652
Form Air	Briercrest	306-799-4501
Kevin Hruska	Gerald	306-745-2711
Kindersley Airspray	Kindersley	306-463-4600
Miccar Aerial Ltd.	Yorkton	306-786-3345
Provincial Airways	Moose Jaw	306-692-7335
Sky Ag Services Ltd.	LaFleche	306-472-5757
Tarrickfic Aerial Ltd.	Abbey	306-741-1969
T-C Aerial Ltd.	Shaunavon	306-297-3222
West Central Air	Rosetown	306-882-3830
Western Ag Air Ltd.	Ormiston	306-475-2563

* For Aerial Applicators to make application of other registered herbicides or in other provinces, check the Alberta, Manitoba or Saskatchewan Aerial Applicator Association website membership directories. ✿

To Roll or Not to Roll

By Dale Risula, PAg, Provincial Specialist, Special Crops and Chantal Jacobs, PAg, Provincial Specialist, Organic Crop Production

On the prairies, precipitation is always welcome; however, the recent rains may have set back the seeding schedule more than anticipated. To facilitate optimum yield in pulse crops, consider crop and soil conditions carefully before rolling.

Figure 10: Rolling lentils prior to emergence. Source: Saskatchewan Agriculture

Rolling is used to improve harvest conditions for peas and lentils. For pea crops, rolling will help push rocks down into the soil surface and break up clumps of soil that can cause problems during straight-combining. For lentils, stone-free soil surfaces are preferred because it is a short crop that is harvested close to the ground. Rolling helps preserve pea and lentil quality as it reduces earth tag on harvested grain. Rolling will not increase pulse crop yields, but it will improve harvest conditions and maintain grain quality.

For both pea and lentil, rolling can occur once seeding is complete up until the fifth node stage. The optimum time to roll is prior to crop emergence. Rolling beyond the fifth node stage will cause bruising and may reduce yields by rupturing plant tissues and facilitating disease entry into the plant. The purpose for rolling is not to pack the soil, but to smooth the soil surface.

After seeding, do not roll pulses if soils are excessively wet or prone to crusting as it can spread disease and negatively affect crop emergence. The optimum time to roll is when the soil is dry. Once the crop has emerged, rolling should be done when the plants are dry and preferably slightly wilted. Rolling can also increase crop damage when other adversities such as frost are factored in.

Herbicide applications may have adverse effects on pulse crops, so rolling and herbicide applications should be separated by at least a couple days. If crops are advanced, spray first and roll three or four days later. Some herbicides have a wide window of application, so you may be able to roll the crop first and spray later. Although rolling past the five node stage is not recommended, weed competition will cause greater yield loss than not rolling your pulse crop, so consider this in your timeline.

For more information on rolling, crop staging and pulse crop production, go to www.saskpulse.com or www.agriculture.gov.sk.ca and click on Crops/Seeding/Establishment of Pulse Crops. ☼

Who's Who in the Plant Industry Section of the Crops Branch

By Penny McCall, PAg Manager, Plant Industry Section

The Crops Branch of the Saskatchewan Ministry of Agriculture is committed to providing strategic development, production and regulatory services to a thriving crop sector. To that end, the majority of branch staff are technical experts who serve as a subject matter resource for problem solving, diagnostics, inspections and the preparation of technical materials, as well as provide sector development and program or policy development. The Crops Branch consists of two sections: the Plant Industry Section and the Production Technology Section. This article will focus on the staff in the Plant Industry Section.

The Plant Industry Section staff consists of a manager and 11 provincial specialists who serve as subject matter resources to the various crop industries or sectors. Provincial specialists work closely with producer associations and other industry partners, and serve as the Ministry representatives on various provincial and national committees. Refer to Figure 11 to put a face to the names in the Plant Industry Section.

Figure 11. *Back Row:* Venkata Vakulabharanam, Blaine Recksiedler, Michel Tremblay, Chantal Jacobs, Glen Sweetman; *Front Row:* Penny McCall, Forrest Scharf, Connie Achtymichuk; *Inserted Row:* Dale Risula, Glenn Payne, Geoff Wilson, Gerry Ivanochko.

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Who's Who in the Plant Industry Section of the Crops Branch

(Continued from page 17)

Venkata Vakulabharanam, PAg – Provincial Specialist, Oilseed Crops
Venkata started in this position in 2008, coming from the Agriculture Research Branch where he was a research program manager for two years. Prior to that, he was involved in agronomic research with ICMS Inc. and also with the Crop Development Centre. He received his BSA from Andhra Pradesh Agricultural University and his MSc (Crop Science) from the University of Saskatchewan, graduating in 1999. Venkata grew up in India.
venkata.vakulabharanam@gov.sk.ca (306) 787-4668

Blaine Recksiedler, PAg – Provincial Specialist, Cereal Crops
Blaine started in this position in 1998, when the position included both cereals and organics. Prior to working with the Ministry, Blaine was the technician for the smut pathology program at AAFC-Winnipeg. Blaine received his BSA (Agricultural Economics) from the University of Manitoba, and his MSc (Crop Science – non-shattering pod trait in dry bean) from the University of Saskatchewan, graduating in 1996. He is originally from Rosenfeld, Manitoba.
blaine.recksiedler@gov.sk.ca (306) 787-4664

Michel Tremblay, PAg – Provincial Specialist, Forage Crops
Michel has served in this role for 17 years. He previously worked with the Saskatchewan Forage Council as the variety testing coordinator. Michel received his BSA (Crop Science) and his MSc (Plant Ecology - grazing system impacts on crested wheatgrass dominated pasture) from the University of Saskatchewan, graduating in 1990. He was raised on a mixed farm near Langham.
michel.tremblay@gov.sk.ca (306) 787-7712

Chantal Jacobs, PAg – Provincial Specialist, Organic Crop Production
Chantal started in this position in the fall of 2007, but began with the Ministry as an agrologist intern at the Agriculture Knowledge Centre in 2005, and the Agriculture Research Branch as a program manager in 2006. Previously, she worked in the private sector and at the Crop Development Centre. Chantal completed her BSA (Soil Science) and her MSc (Soil Science – soil nutrient cycling and manure management) at the University of Saskatchewan, graduating in 2006. She grew up on a grain farm near Naicam. chantal.jacobs@gov.sk.ca (306) 798-0945

Glen Sweetman, PAg – Provincial Specialist, Greenhouse and Nursery Crops
Glen started with the Ministry in 1998. Glen received his BSc (Horticulture) from Montana State University and he's also taken courses at the University of Alberta, Olds College and Red Deer College. Glen has a diverse background: managing a nursery and a garden centre, working as an urban forester, a consultant in Australia and a greenhouse grower, and has also done volunteer work in Tibet and China. Glen is originally from Red Deer, Alberta. Glen.sweetman@gov.sk.ca (306) 787-6606

Penny McCall, PAg – Manager, Plant Industry Section
Penny served in the role of Provincial Specialist, Plant Disease, with the Ministry for 10 years prior to becoming Manager of the section in 2009. Previously, she worked in the ginseng industry in British Columbia. She has her BSA (Agricultural Biology) and her MSc (Plant Pathology – sclerotinia disease of canola and sunflower) from the University of Saskatchewan, graduating in 1994. She grew up on a grain farm near Tisdale. penny.mccall@gov.sk.ca (306) 787-4661

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Who's Who in the Plant Industry Section of the Crops Branch

(Continued from page 18)

Forrest Scharf, AAg – Provincial Specialist, Fruit Crops
Forrest started in this position in the fall of 2007. He has a BA (Philosophy) from the University of Victoria and a BSA (Horticulture) from the University of Saskatchewan, graduating in 1999. Prior to joining the Ministry, he was the Special Crops Technologist for Alberta Agriculture. Prior to that, he worked for several years at the University of Saskatchewan in the Fruit Breeding and Research Program. His family's farm is located near Melfort. forrest.scharf@gov.sk.ca (306) 787-4666

Connie Achtymichuk, PAg – Provincial Specialist, Vegetable Crops
Connie joined the Ministry in 2005. She obtained her BSA (Horticulture) from the University of Saskatchewan in 1986 and began her career as a research technician at the university's vegetable program, working on potato variety trials and herbicide trials in onions. She moved to Manitoba for a few years to manage an early generation seed potato farm before moving back to Saskatchewan. Connie grew up near Kamsack, where her family still farms.
connie.achtymichuk@gov.sk.ca (306) 787-2755

Dale Risula, PAg – Provincial Specialist, Special Crops
Dale has worked with the Ministry for 28 years in six different branches, including Extension, Research and the Agriculture Knowledge Centre, and came to the Crops Branch in 2008. He has a BSA (Soil Science and Microbiology) from the University of Saskatchewan. Dale has worked the majority of his career with farmers in the heart of the pulse production area. Dale is originally from Saskatoon. dale.risula@gov.sk.ca (306) 787-4665

Glenn Payne, AAg – Provincial Specialist, Bioproducts
Glenn started with the Ministry in 1994 as the crops analyst in the Policy Branch and made the switch to the Crops Branch in 2007. He has a Vocational Ag Diploma, a BSA, and a MSc (Agricultural Economics – pricing behaviour of the western Canadian fertilizer industry) from the University of Saskatchewan, graduating in 1994. Glenn has been involved in his family's mixed farm northwest of Yorkton throughout his education and career. glenn.payne@gov.sk.ca
(306) 798-0944.

Geoff Wilson, AAg – Provincial Specialist, Apiculture
Geoff started with the Ministry in April, 2009, and is located in the Prince Albert office. Geoff received his BSA (Agriculture) and his MSc (Environmental Biology) from the University of Guelph, graduating in 2004. Prior to moving to Saskatchewan, Geoff was the owner and operator of a 500-colony beekeeping business near Kingston, Ontario. geoff.wilson@gov.sk.ca
(306) 953-2304

Gerry Ivanochko, PAg – Provincial Specialist, Northern Agriculture
Gerry has worked for the Ministry for 25 years and is located in La Ronge. He obtained his MSc (Horticulture) from the University of Alberta. Gerry works with producers/wildcrafters, processors and marketers in the wild rice and other non-timber forest product industries. He also worked overseas in Ghana, West Africa, for six years in small-scale irrigation projects, and in northern Thailand. gerry.ivanochko@gov.sk.ca (306) 425-4400 ✿

Canaryseed Website Launched!

The Canaryseed Development Commission of Saskatchewan (CDCS) has a new website. The commission was established in 2006, with the mandate to administer a producer levy on canaryseed sales on behalf of Saskatchewan canaryseed growers. The website provides information on markets, prices, varieties, agronomy, registered buyers and much more valuable information for canaryseed growers.

The website can be viewed at **www.canaryseed.ca**.
The CDCS can be contacted at:
Kevin Hursh, Executive Director
Tel: 306-933-0138
kevin@hursh.ca

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